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FINAL REPORT

JANUARY 1989

EVT 39-87

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MIL-STD-1660 TEST OF PA116
CONTAINER ON A STANDARD
METAL PALLET WITH FORK
TINE PROTECTION.

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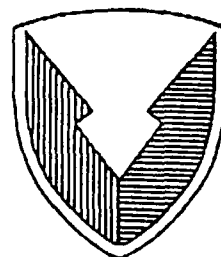
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Office of the Project Manager for Ammunition Logistics
ATTN: AMCPM-AL
Picatinny Arsenal, NJ 07806-5000

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US ARMY
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EVALUATION DIVISION
SAVANNA, ILLINOIS 61074-9639

US ARMY DEFENSE AMMUNITION
CENTER AND SCHOOL

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SECURITY CLASSIFICATION OF THIS PAGE

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<p>— The U.S. Army Defense Ammunition Center and School (USADACS) was asked to design a protective system into the Standard Metal Pallet to prevent forklift tines from puncturing the PA116 containers. As a result, a guard plate was added to the PA116 pallet adaptor. The guard plate provides six inches of barrier along the length of the bottom row of the container. In order to verify this modified version of the PA116 metal pallet, it was subjected to the requirements of MIL-STD-1660, Design Criteria for Ammunition Loads. The test specimens, consisting of a standard metal pallet, pallet adaptor with forklift protector, top lift assembly, and inert loaded PA116 containers, weighed 2,423 pounds in a 44 inches W x 40 inches L x 50-1/2 inches high. Tests performed on the specimen were compression, repetitive shock, (vibration), edgewise rotational drop, and inclined impact. As a result of these tests, the test specimen sustained some damage in loosening</p>					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL THOMAS J. MICHELS, Chief, Evaluation Division			22b. TELEPHONE (Include Area Code) AV 585-8080		22c. OFFICE SYMBOL SMCAC-DEV

19. Continued

of the banding straps and lateral load shifting on the pallet. Despite these faults, the pallet is considered acceptable by the criteria of MIL-STD-1660. (c) —

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL
Evaluation Division
Savanna, IL 61074-9639

REPORT NO. EVT 39-87
MIL-STD-1660 TEST OF PA116 CONTAINER ON A STANDARD
METAL PALLET WITH FORK TINE PROTECTION

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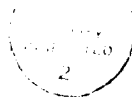
PART 1

INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS) was tasked by the Office of the Project Manager for Ammunition (PM-AMMOLOG), AMCPM-AL, to add a protective barrier along the lateral side of the standard metal pallet for reducing the number of accidental container punctures from forklift tines. As a result of this request, USADACS modified the PA116 Container Pallet Adaptor assembly with a six-inch-high formed metal plate along the lateral side of the container.

B. AUTHORITY. This test was conducted in accordance with mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command, (AMCCOM), and AR 740-1.

C. OBJECTIVE. The objective of this test is to evaluate the PA116 Standard Metal Pallet with forklift protector in accordance with MIL-STD-1660 design criteria for ammunition unit loads.



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PART 2

ATTENDEES

Mr. A. C. McIntosh, Jr.
Test Engineer
AV 585-8989
Comm (815) 273-8989

U.S. Army Defense Ammunition Center and School
ATTN: SMCAC-DEV
Savanna, IL 61074-9639

PART 3

TEST PROCEDURES

The test procedures outlined in this section were extracted from MIL-STD-1660, Design Criteria for Ammunition Unit Loads, 8 April 1977. This standard identifies nine steps that a unitized load must undergo if it is considered to be acceptable. The five tests that were conducted on the test pallet are synopsized below.

1. STACKING TESTS. The unit load shall be loaded to simulate a stack of identical unit loads stacked 16 feet high, for a period of one hour. This stacking load is simulated by subjecting the unit load to a compression weight equal to an equivalent 16-foot stacking height. The compression load is calculated in the following manner: The unit load weight is divided by the unit load height in inches and multiplied by 192. The resulting number is the equivalent compressive load of a 16-foot-high stack.

2. REPETITIVE SHOCK TEST. The repetitive shock test shall be conducted in accordance with Method 5019, Federal Standard 101. The test procedure is as follows: The test specimen shall be placed on, but not fastened to, the platform. With the specimen in one position, vibrate the platform at 1/2-inch amplitude (1-inch double amplitude) starting at a frequency of about 3-cycles-per-second. Steadily increase the frequency until the package leaves the platform. The resonant frequency is achieved when a 1/16-inch-thick feeler may be momentarily slid freely between every point on the specimen in contact with the platform at some instance during the cycle or a

platform acceleration achieves one plus or minus zero point one G. Midway into the testing period the specimen shall be rotated 90 degrees and the test continued for the duration. Unless failure occurs, the total time of vibration shall be two hours if the specimen is tested in one position; and, if tested in more than one position, the total time shall be three hours.

3. EDGEWISE DROP TEST. This test shall be conducted by using the procedures of Method 5008, Federal Standard 101. The procedure for the Edgewise Drop (Rotational) Test is as follows: The specimen shall be placed on its bottom with one end of the base of the container supported on a sill nominally 6 inches high. The height of the sill shall be increased, if necessary, to ensure that there will be no support for the base between the ends of the container when dropping takes place, but should not be high enough to cause the container to slide on the supports when the dropped end is raised for the drops. The unsupported end of the container shall then be raised and allowed to fall freely to the concrete, pavement, or similar underlying surface from a prescribed height. Unless otherwise specified, the height of drop for level A protection shall conform to the following tabulation.

Table 1: Drop Levels

<u>GROSS WEIGHT</u> <u>NOT EXCEEDING</u>	<u>DIMENSIONS ON ANY EDGE</u> <u>NOT EXCEEDING</u>	<u>HEIGHT OF DROP LEVEL</u> <u>A PROTECTION</u>
600 lbs.	72 inches	36 inches
3,000 lbs.	no limit	24 inches
no limit	no limit	12 inches

4. IMPACT TEST. This test shall be conducted by using the procedure of Method 5023, Incline-Impact Test of Federal Standard 101. The procedure for the Incline-Impact Test is as follows: The specimen shall be placed on the carriage with the surface or edge which is to be impacted projecting at least 2 inches beyond the front end of the carriage. The carriage shall be brought to a predetermined position on the incline and released. If it is desired to concentrate the impact on any particular position on the container, a 4x4-inch timber may be attached to the bumper in the desired position before the test. No part of the timber shall be struck by the carriage. The position of the container on the carriage and the sequence in which surfaces and edges are subjected to impacts may be at the option of the testing activity and will depend upon the objective of the tests. When the test is to determine satisfactory requirements for a container or pack, and, unless otherwise specified, the specimen shall be subjected to one impact on each surface that has each dimension less than 9.5 feet. Unless otherwise specified, the velocity at time of impact shall be 7 feet per second.

PART 4

TEST EQUIPMENT

1. TEST SPECIMEN.
 - a. Width: 44 inches
 - b. Length: 40 inches
 - c. Height: 50-1/2 inches
 - d. Weight: 2,423 pounds
2. COMPRESSION TESTER.
 - a. Manufacturer: Ormond Scientific
 - b. Platform: 60 inches by 60 inches
 - c. Compression Limit: 50,000 pounds
 - d. Tension Limit: 50,000 pounds
3. TRANSPORTATION SIMULATOR.
 - a. Manufacturer: Gaines Laboratory
 - b. Capacity: 5,000 pound pallet
 - c. Displacement: 1/2-inch Amplitude
 - d. Speed: 50 to 300 cpm
 - e. Platform: 5 feet by 8 feet
4. INCLINED RAMP
 - a. Manufacturer: Conbur Incline
 - b. Type: Impact Tester
 - c. Grade: 10 Percent Incline
 - d. Length: 12-foot Incline Ramp

PART 5

TEST RESULTS

1. STACKING TEST. Pallet Weight: 2,423 lbs. Pallet Height: 50-1/2 in. Test Load Weight: 9,200 lbs. The PA116 Standard Metal Pallet with the forklift protector was loaded to a test weight of 9,200 pounds in the compression tester. It remained under compression for a period of 60 minutes. Some loosening of the banding straps was noticed. At the end of the test period, the compression load decreased to 8,500 pounds. When the compression load was removed and the test specimen taken out of the compression test fixture, the banding straps returned to the original tension, and no measurable deformation in the load was recordable.

2. REPETITIVE SHOCK TEST. The PA116 Standard Metal Pallet with forklift protector was subjected to two 90 minute periods in the transportation simulator. During the first 90 minute period, the pallet skids were oriented longitudinally to the direction of motion. The Transportation Simulator was operated at 200 rpm in order to achieve a 1/16 inch displacement between the pallet skids and transportation simulator deck. A rotational speed of 200 rpm induces a 1 g shock into the test specimen.

3. EDGEWISE ROTATIONAL DROP TEST. Each side of the pallet is placed on a beam displacing it 6 inches above the floor. The opposite side is raised to a height of 24 inches above the floor and then dropped. The pallet skids were oriented longitudinally for the first and third impacts and laterally for the second and fourth

impacts. When the pallet was dropped with the sides oriented in the longitudinal direction, the outside truss members deformed from the impact. As a result of this deformation, the ends of the sides became bowed instead of remaining flat. After the second and fourth impacts, the outer sides were bent outward. Also, the pallet deck became bowed.

4. INCLINED IMPACT TEST. The incline impact test consisted of placing the PA116 Standard Metal Pallet with forklift protector on an inclined impact test with two inches of the pallet projecting over the edge of the sled. The sled was raised approximately eight feet up the inclined ramp and release, allowing the sled to accelerate into a solid wall with an optional 6 inch x 8 inch beam at the base. This test was repeated once on each side of the pallet. To impact on the bell end, the containers were oriented longitudinally to the direction of impact. The PA116 container interlocks did not become disengaged nor was there additional damage to the pallet skids or truss post. With the pallet turned 180 degrees and impacting the closed container end, no additional damage occurred to the unitization. For the remaining two impacts, the PA116 containers and pallet skids were oriented parallel to the direction of impact. When impacted in this orientation, the forklift protectors were deformed from the impacting with the optional beam and the lower row of containers. When this occurred, the top row of containers (5 containers) became disengaged from the second row. Also the bell end flats remained in parallel contact with the impact tester wall. The bells on the third row of containers were in partial wall contact. Dynamically, the top four rows of containers made contact

with the impacting surface while the pallet skid was offset by the amount presented by the optional beam.

PART 6

CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSIONS. The PA116 Standard Metal Pallet with forklift protector technically satisfied the requirements of MIL-STD-1660 in that it retained the load after all of the specified tests. However, after testing, the pallet unit was loosened up enough that it would probably fall apart after additional rough handling. This test sequence caused damage to the pallet skid trusses, caused the pallet skids to bend upward, and warped the pallet deck. The pallet adapter with the forklift protector was damaged to a point where the PA116 container had a lateral side slip of two inches. The test specimen was six inches out of square after testing with the first and second rows of container interlocks disengaged.

2. RECOMMENDATIONS. It is recommended that the following design changes be made. The pallet skid should be redesigned to prevent damage to the truss post. The pallet adapter should be modified to reduce the amount of lateral movement. Intermediate dunnage and a better interlocking system of the PA116 container should be developed to eliminate lateral load skewing from bottom to top.

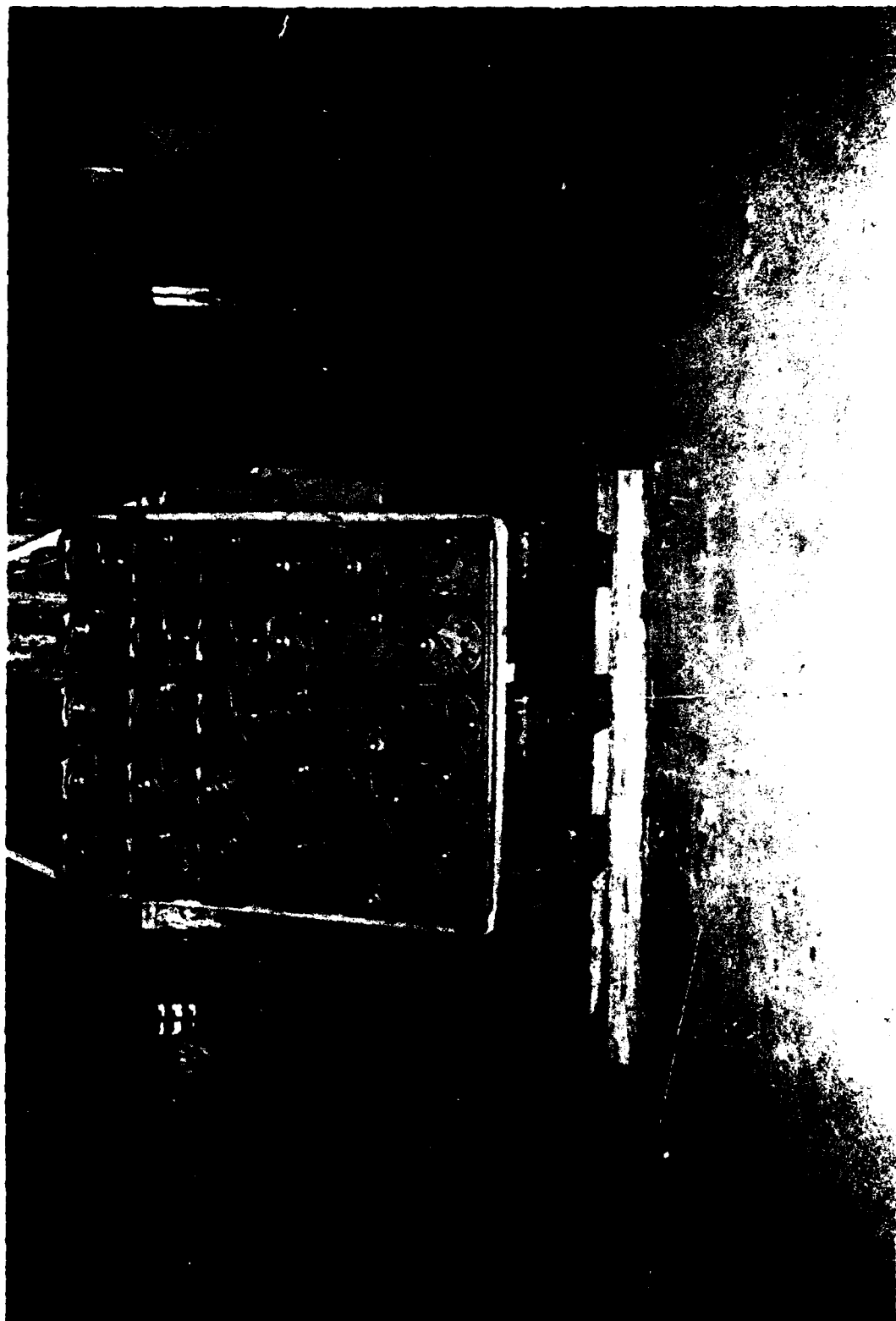
PART 7

PHOTOGRAPHS



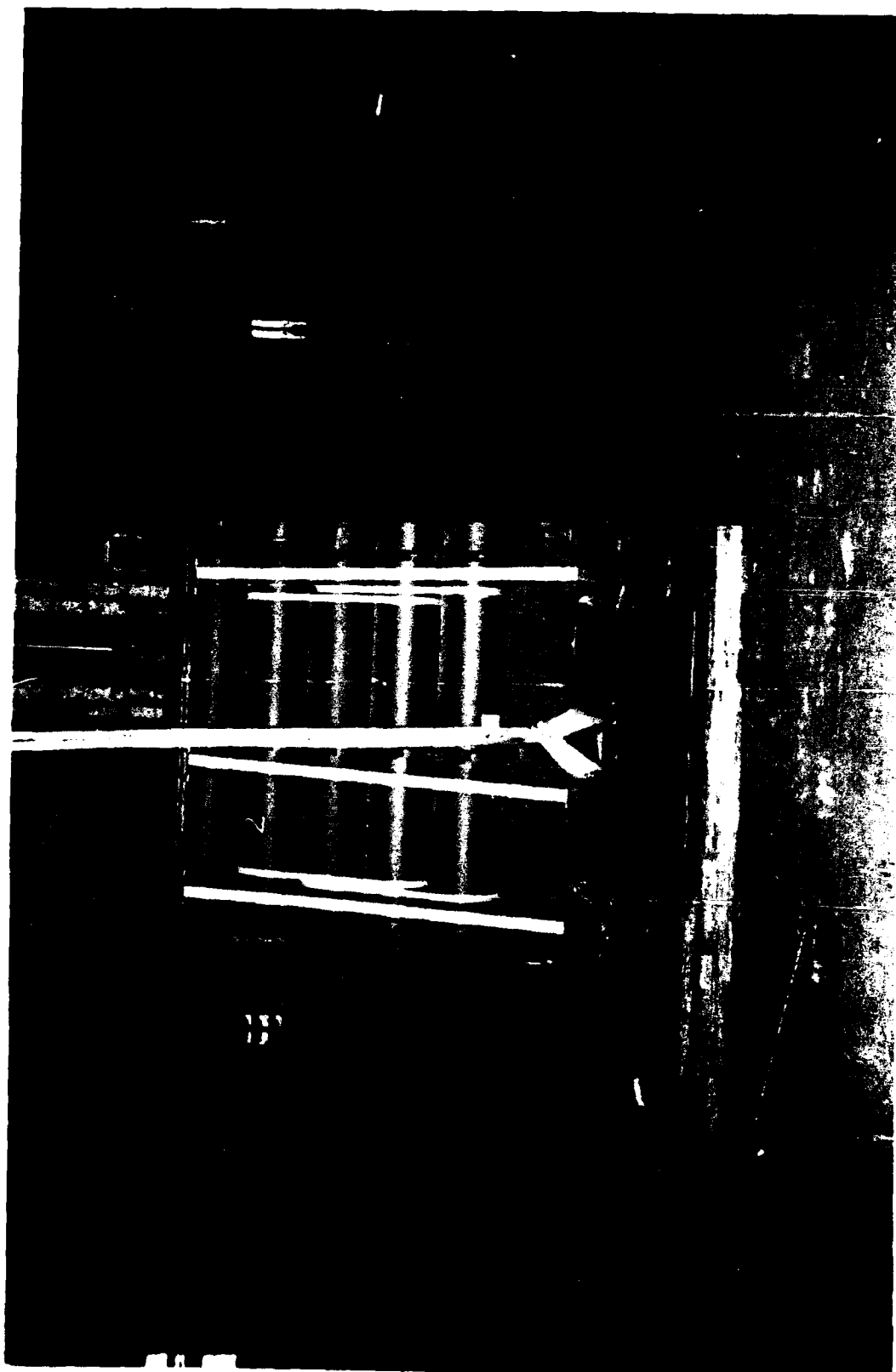
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Photo No. 1. This photo shows the PA116 Standard Metal Pallet with forklift protector in the Transportation Simulator. Operational speed of the simulator was 20C rpm to produce a 1/16-inch clearance between skids and the tester deck.



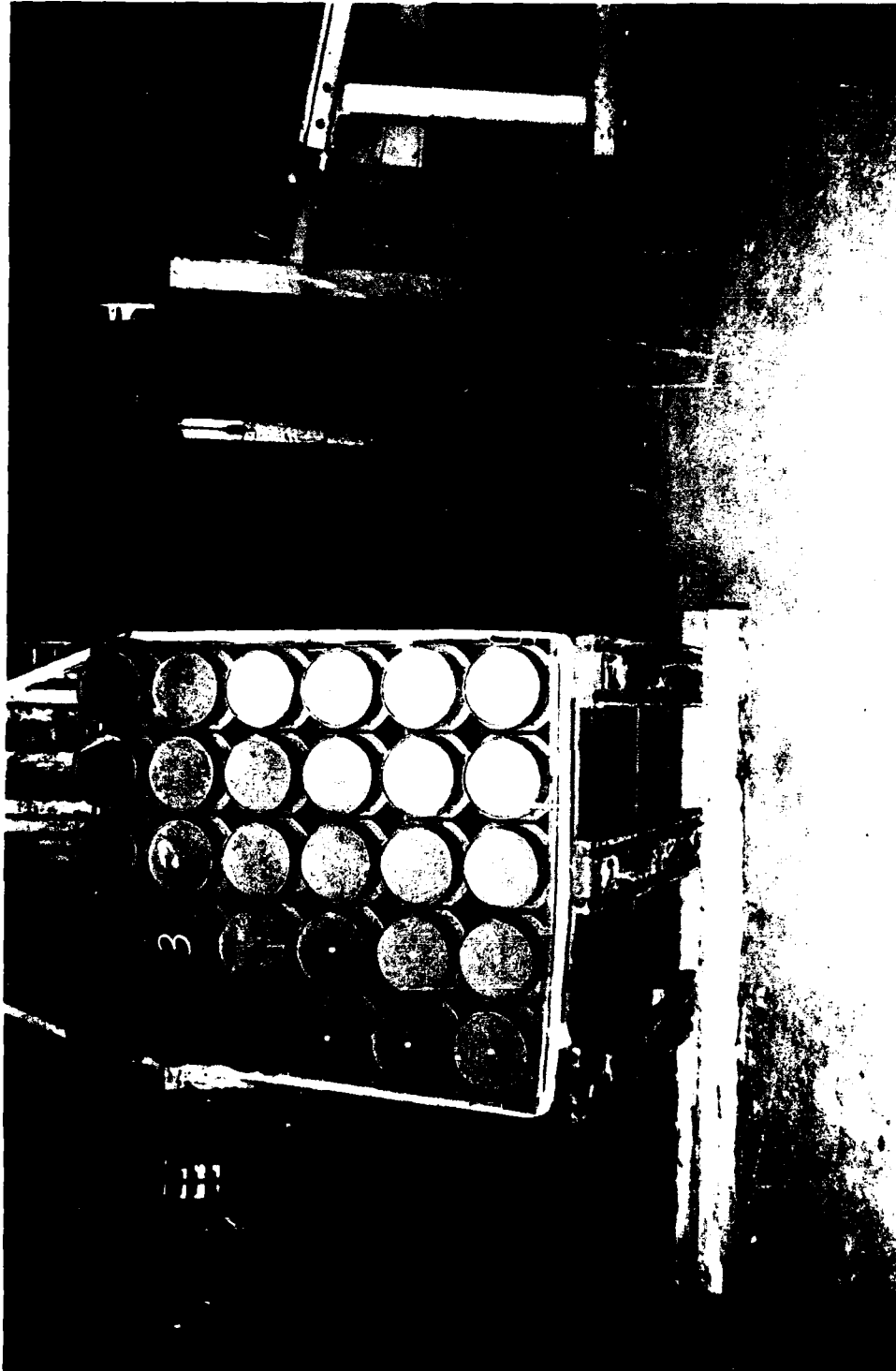
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Photo No. 2. This photo shows the PA116 Standard Metal Pallet with forklift protector positioned for the first edgewise rotational drop test. Drop height is 24 inches.



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Photo No. 3. This photo shows the PA116 Standard Metal Pallet with forklift protector positioned for the second edgewise rotational drop test. Note the deformation of the pallet skids on the left. This deformation was caused by the first drop test. Also note that all three outside truss members have been deformed.



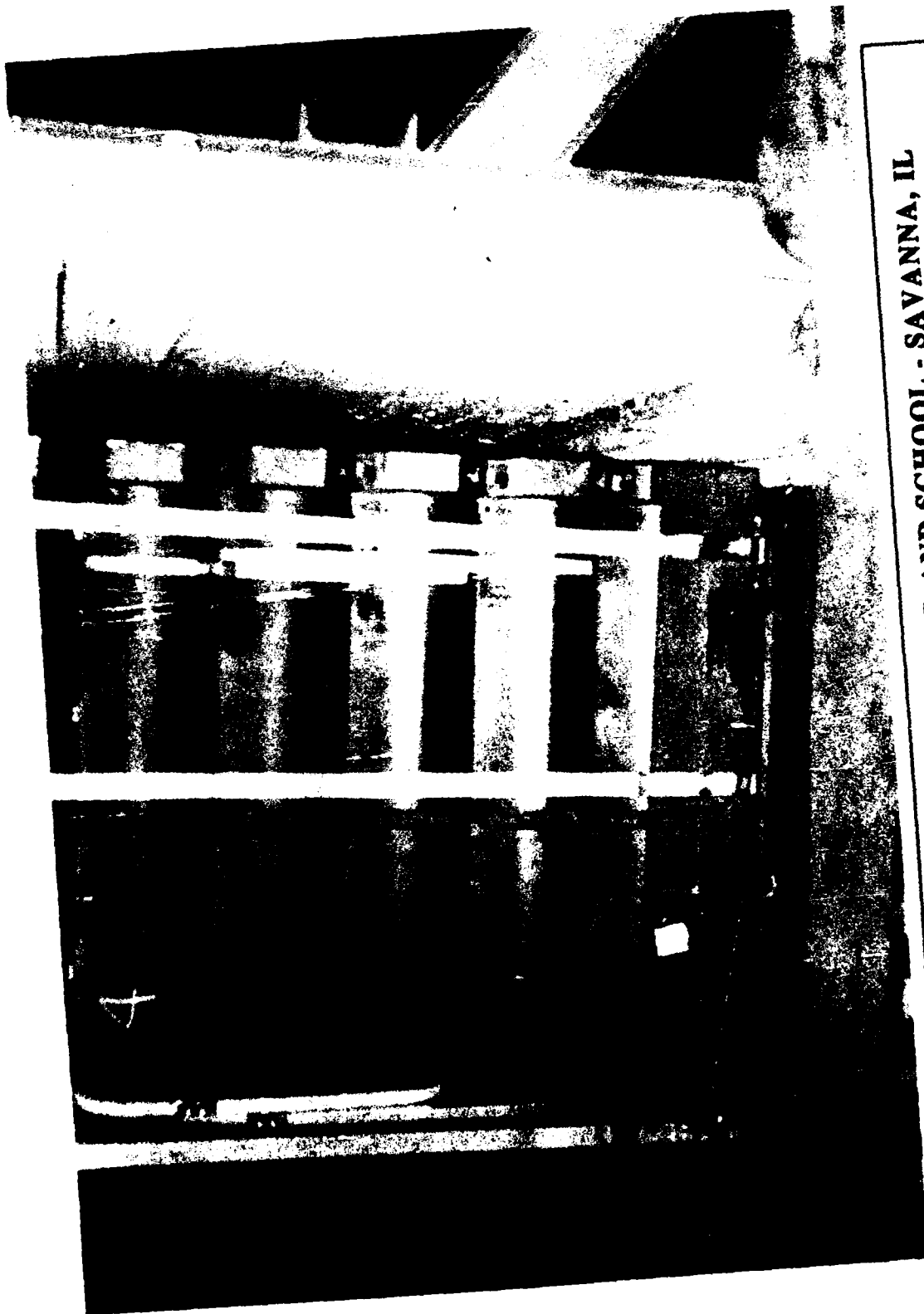
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Photo No. 4. This photo shows the PA116 Standard Metal Pallet with the forklift protector positioned for the third edgewise rotational drop test. Note the skid on the left. It is not in contact with the six-inch beam. The center and right skids are in contact with the beam. Photo 2 shows all three skids in contact with the six-inch beam. The first lateral caused the pallet to deform or warp. This warp allows the pallet to rock side to side.



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Photo No. 5. This photo shows the PA116 Standard Metal Pallet with forklift protector ready for the last rotational drop test. Note damage to skids and truss posts. This damage was caused by the edgewise rotational drop tests. After this test, the pallet deck sustained additional bending.



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Photo No. 6. This photo shows the PA 116 Standard Metal Pallet with forklift protector after the first inclined impact test.



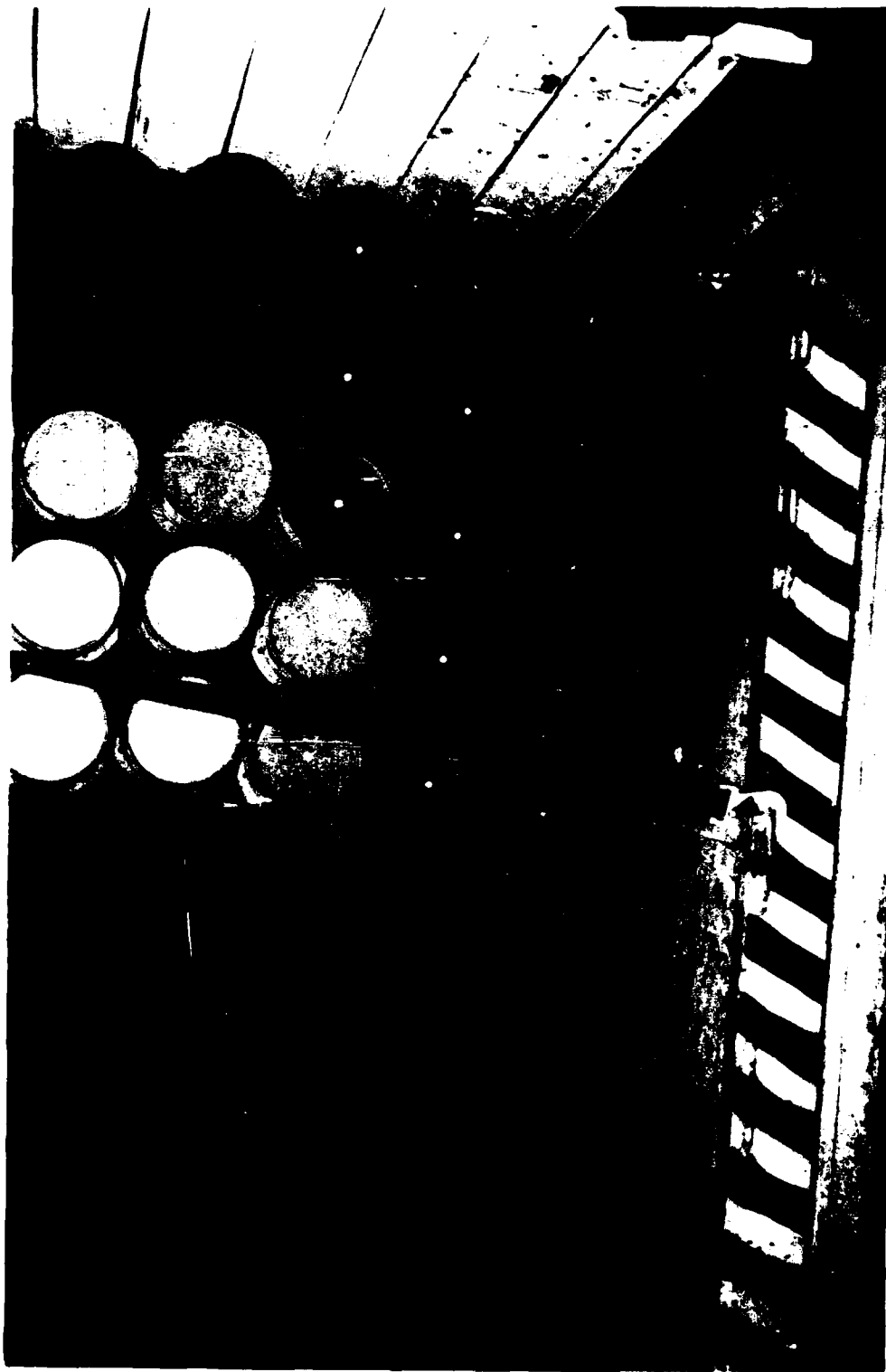
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Photo No. 7. This photo shows the PA 116 Standard Metal Pallet with forklift protectors after the second inclined impact. Note gap between the bottom row of containers and the pallet adapter. Also note upper pallet skewing as compared to the skid and deformation of the forklift protector on the side of impact.



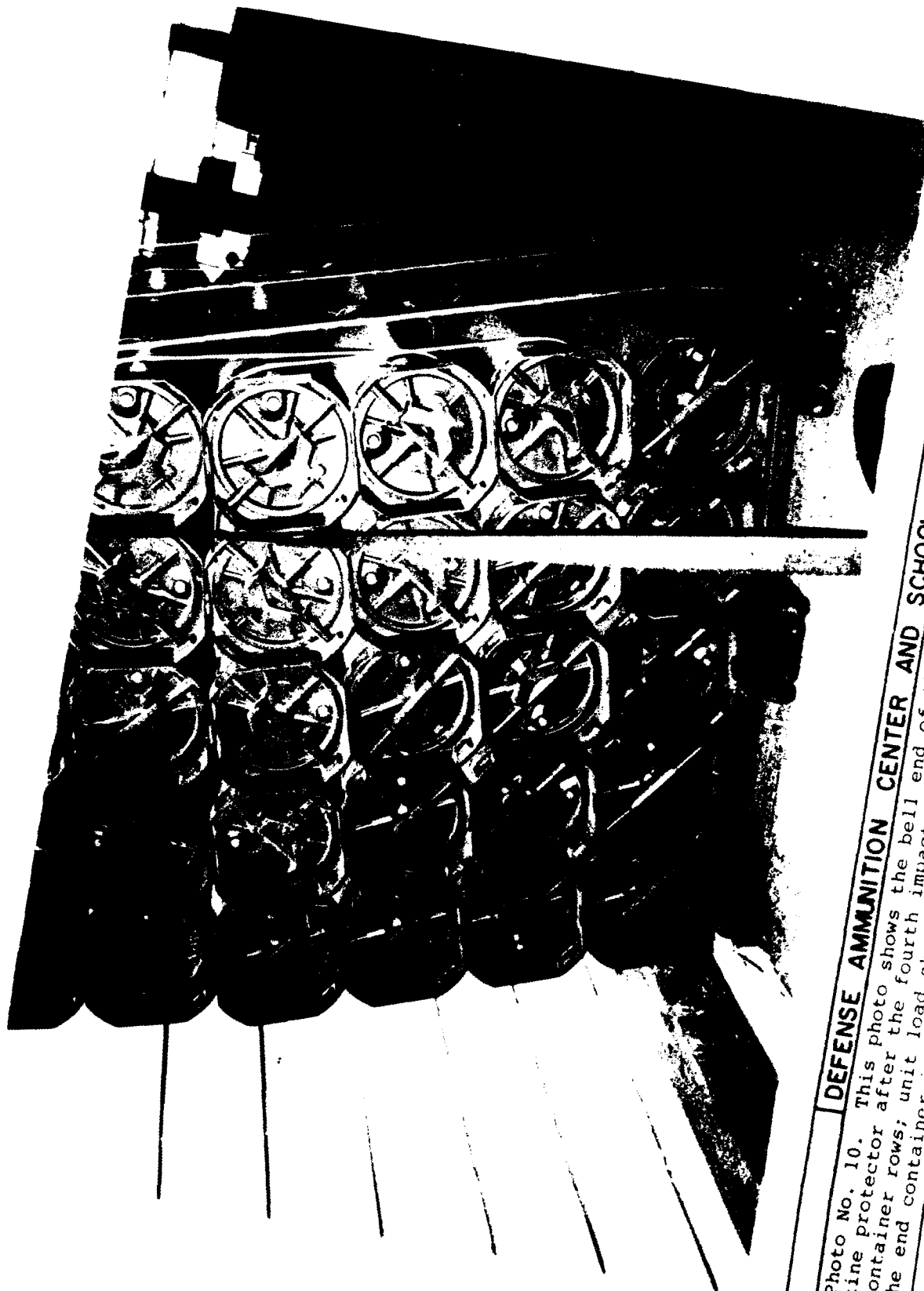
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Photo No. 8. This photo shows the PA116 Standard Metal Pallet with forklift protector after the third inclined impact.



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Photo No. 9. This photo shows the PA116 Standard Metal Pallet with forklift protector after the fourth and last inclined impact. Note: Disengagement of the two container rows from container interlocks; load skew from top to bottom; damage to the forklift protector on the right; and increased displacement of the bottom row of containers and the left forklift protector.



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Photo No. 10. This photo shows the bell end of the PALL6 Standard Metal Pallet with fork-tine protector after the fourth impact. Note: Interlock disengagement in the top two container rows; unit load skew; damage to the fork-tine protectors; and disengagement of the end container in the second row.

PART 8

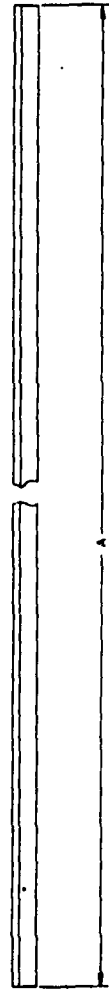
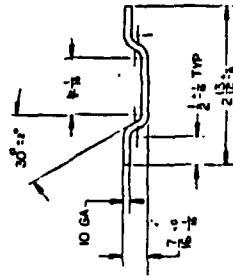
DRAWINGS

PART 8
PALLET ASSEMBLY DRAWINGS

IDENTIFICATION NUMBER	DRAWING SIZE	DOCUMENT NUMBER	SHEET NUMBER	REV	NOMENCLATURE
28620	C	AC200000423	1 OF 1	A	CHEMICAL AGENT RESISTANT COATING (CARC) FINISHING REQUIREMENTS FOR METAL PALLETS AND/OR PALLET ADAPTORS
28620	D	AC200000427	1 OF 1		STIFFENER - PALLET, SHEET METAL
28620	D	AC200000428	1 OF 1	A	SKID-PALLET, SHEET METAL
28620	D	AC200000429	1 OF 1	A	POST-PALLET, SHEET METAL
28620	D	AC200000430	1 OF 1	A	DECK-PALLET, STANDARD SIZE 44 X 40 SHEET METAL
28620	D	AC200000431	1 OF 1	A	PALLET-STANDARD SIZE 44 X 40 SHEET METAL
28620	C	AC200000448	1 OF 1		LUG-STACKING, METAL PALLET
28620	C	AC200000453	1 OF 1		LUG-ALIGNING, METAL PALLET
28620	D	AC200000460	1 OF 1		BOW-STRAPING, METAL PALLET
28620	D	AC200000462	1 OF 1		RAIL, TOP LIFTING FRAME METAL PALLET
28620	D	AC200000463	1 OF 1		SHIM-TOP LIFTING FRAME, METAL PALLET
28620	D	AC200000464	1 OF 1		STIFFENER, SQUARE BELL, METAL PALLET ADAPTER
28620	D	AC200000465	1 OF 1		STIFFENER, FRONT BELL, METAL PALLET ADAPTER
28620	D	AC200000466	1 OF 1		RAIL, BOTTOM METAL PALLET ADAPTER
28620	C	AC200000468	1 OF 1		RING-LIFTING, METAL PALLET
28620	F	AC200000469	1 OF 1		TOP ASSEMBLY-PALLET ADAPTER, PALL6 CONTAINER
28620	D	AC200000470	1 OF 1		BOTTOM ASSEMBLY-PALLET ADAPTER, PALL6 CONTAINER
28620	F	AC200000501	1 OF 1		ADAPTER-PALLET, PALL6 CONTAINER
28620	C	AC200000501	1 OF 1		PALLET PALL6 CONTAINER (150 METRIC)
		ANSI Y14.5-82			DIMENSIONING AND TOLERANCING
		ASTM A36			SPECIFICATIONS FOR STRUCTURAL STEEL
		ASTM A306			STEEL, SHEET, CARBON, COLD ROLLED, COMMERCIAL QUALITY
		ASTM A508			STEEL, SHEET, CARBON, AND HIGH STRENGTH, LOW ALLOY, HOT ROLLED, AND COLD ROLLED
		ASTM A569			STEEL, CARBON (0.15 MAXIMUM, PERCENT) HOT ROLLED, SHEET AND STRIP, COMMERCIAL QUALITY
		AWS A2.4-86			STANDARD SYMBOLS FOR WELDING, BRAZING AND NONDESTRUCTIVE EXAMINATION
		FED-STD-595			COLORS
		MIL-A-2550			AMMUNITION, GENERAL SPECIFICATIONS FOR
		MIL-C-46168			COATING, ALIPHATIC POLYURETHANE, CHEMICAL AGENT RESISTANT
		MIL-C-53039			COATING, ALIPHATIC POLYURETHANE, SINGLE COMPONENT CHEMICAL AGENT RESISTANT
		MIL-STD-171			FINISHING OF METAL AND WOOD SURFACES
		MIL-STD-1261			ARC WELDING PROCEDURES FOR CONSTRUCTIONAL STEELS
		MIL-T-704			TREATMENT AND PAINTING OF MATERIAL
		MIL-P-52192			PRIMER COATING, EPOXY

PART 8
PALLET ASSEMBLY DRAWINGS (CONT.)

IDENTIFICATION NUMBER	DRAWING SIZE	DOCUMENT NUMBER	SHEET NUMBER	REV	NOMENCLATURE
		MIL-P-53022			PRIMER, EPOXY COATING, CORROSION INHIBITING, LEAD AND CHROMATE FREE
		MIL-P-53030			PRIMER COATING, EPOXY, WATER REDUCIBLE, LEAD AND CHROMATE FREE
		MIL-W-52574			WELDING PROCESS AND WELDING PROCEDURE REQUIREMENTS FOR MANUFACTURE OF EQUIPMENT UTILIZING STEELS
		TT-C-490			CLEANING METHODS FOR FERROUS SURFACES AND PRETREATMENTS FOR ORGANIC COATINGS
		TT-P-636			PRIMER COATING, ALKYD, WOOD AND FERROUS METAL
		TT-P-664			PRIMER COATING, SYNTHETIC, RUST-INHIBITING, LACQUER RESISTING
		TT-P-1757			PRIMER COATING, ZINC CHROMATE, LOW MOISTURE SENSITIVITY

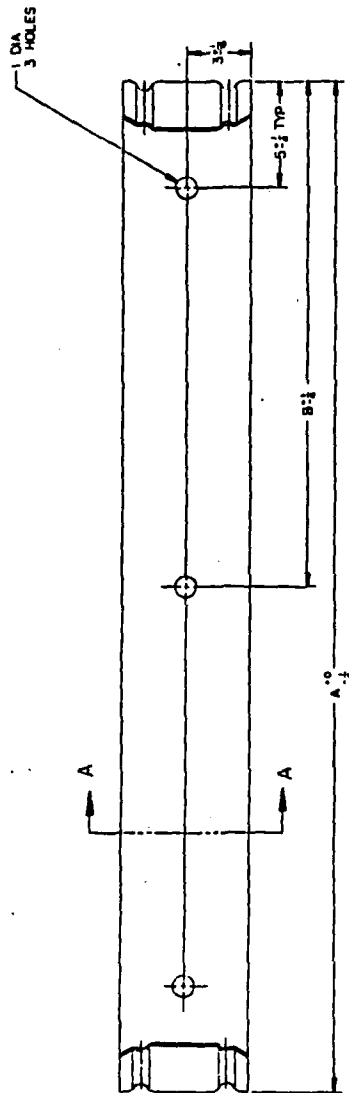


DASH NO.	A
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-3	36:1

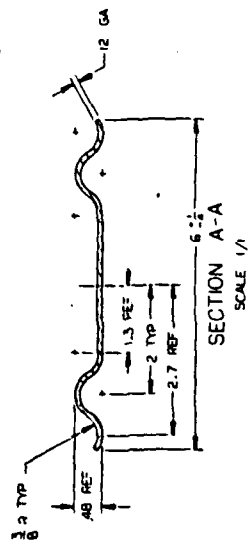
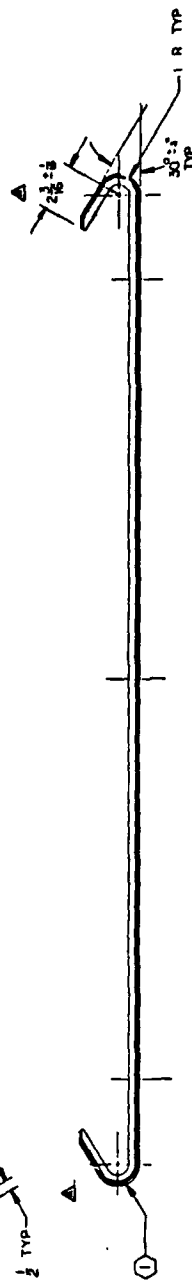
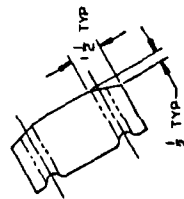
- NOTES:
1. BEND RADIUS 1/8 INCH MAXIMUM, WHERE NOT NOTED
 2. MATERIAL SHEET SAE OR ANSI 100, STEEL CARBON
 3. COLD OR HOT ROLLED, PER ASTM A568 (ASTM A366 OR A569)
 3. ALL DIMENSIONS ARE IN INCHES

DATE: 21 NOV 56 BY: [Signature] CHECKED: [Signature] APPROVED: [Signature]		ARMAMENT, MATERIALS COMMAND STIFFENER - PALLET, SHEET METAL
DASH NO. 28820 AC200000427		APPLICATION

REVISION
A 1. CHANGED DIMENSION
2. ADD NOTE



DRAWING NO.	A	B
-1	34	22
-2	45 1/2	22 1/2
-3	48	24
-4	53	26 1/2

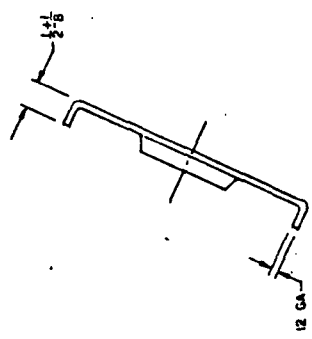


HIDDEN LINES OMITTED FOR CLARITY
SCALE 3/8

NOTES:
1. BEND RADIUS NOTED
2. MATERIAL: S15 OR ANS/100 STEEL, CARBON COLD ROLLED OR HOT ROLLED, PER ASTM A568 (ASTM A366 OR A569)
3. ALL DIMENSIONS ARE IN INCHES
① 4. DISTORTION IN THE BEND IS PERMISSIBLE

DATE 28 NOV 86		ARMAMENT, MUNITIONS & CHEMICAL COMMAND	
BY 35		SKID -	
CHK 8		PALLET, SHEET METAL	
JAN 87		D 28820	
AC2000000428		FORM 1071	
APPLICATION			

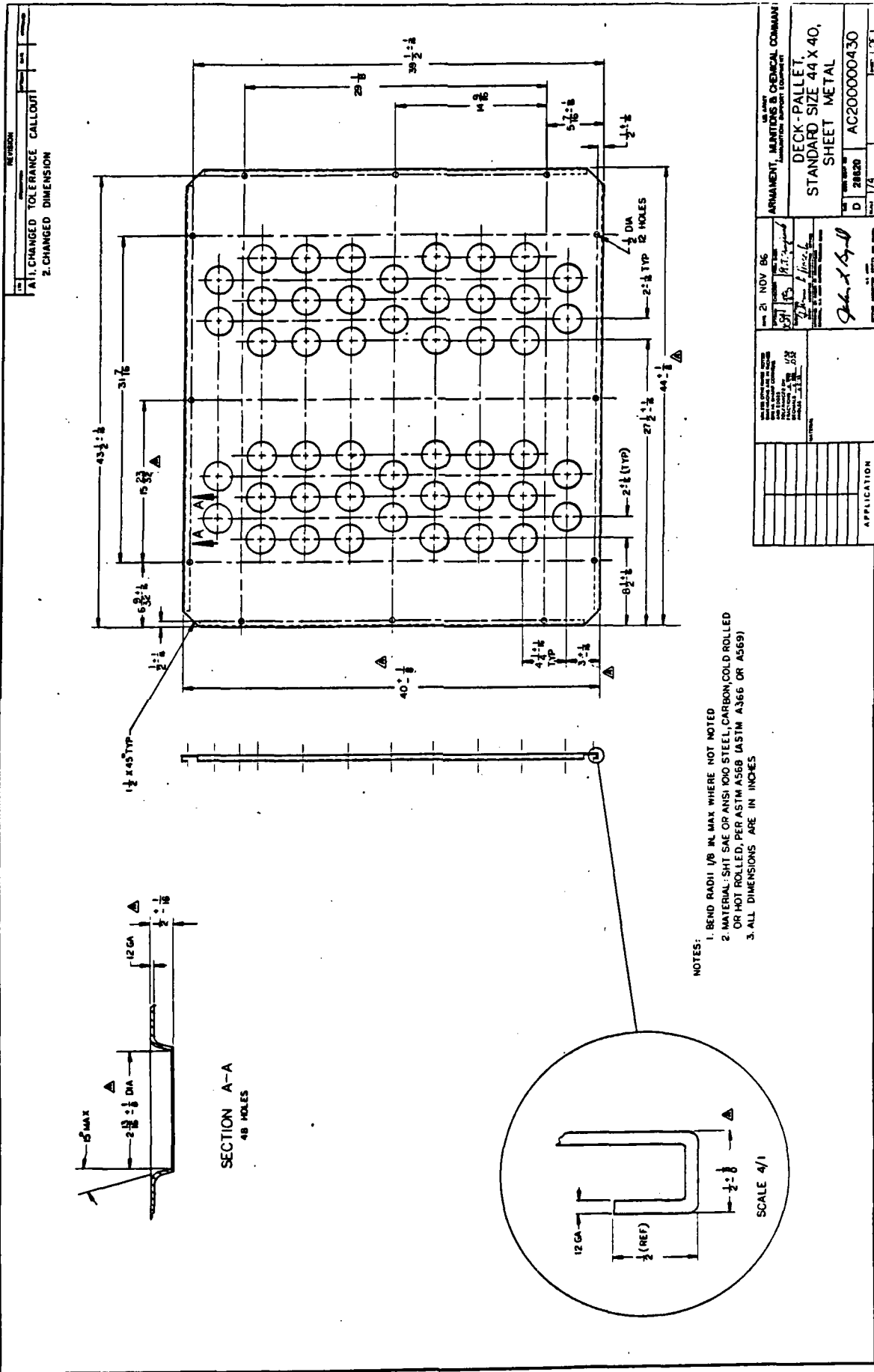
UNCLASSIFIED



SECTION A-A

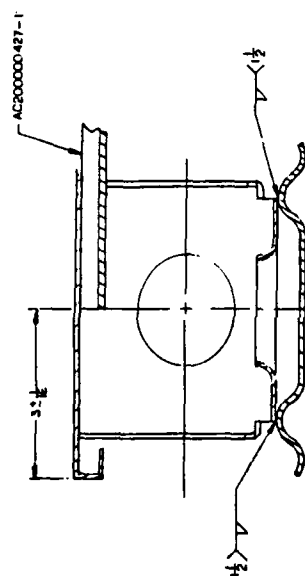
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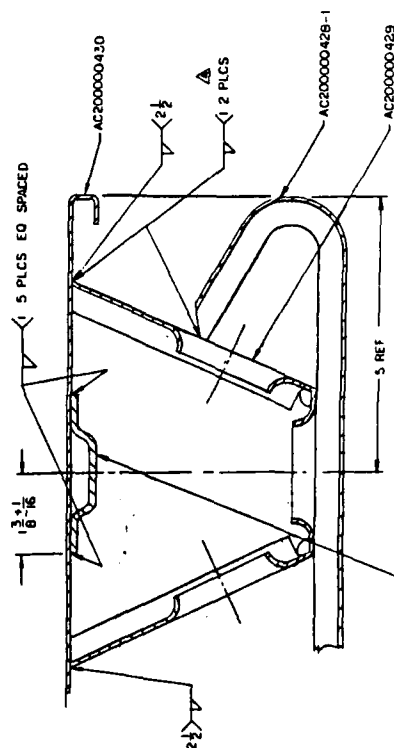


REVISION

NO.	DESCRIPTION
1	REDRAW DETAIL
2	ADD LENGTHS TO WELD CALLOUTS
3	CHANGED DIMENSION
4	CHANGED TOLERANCE

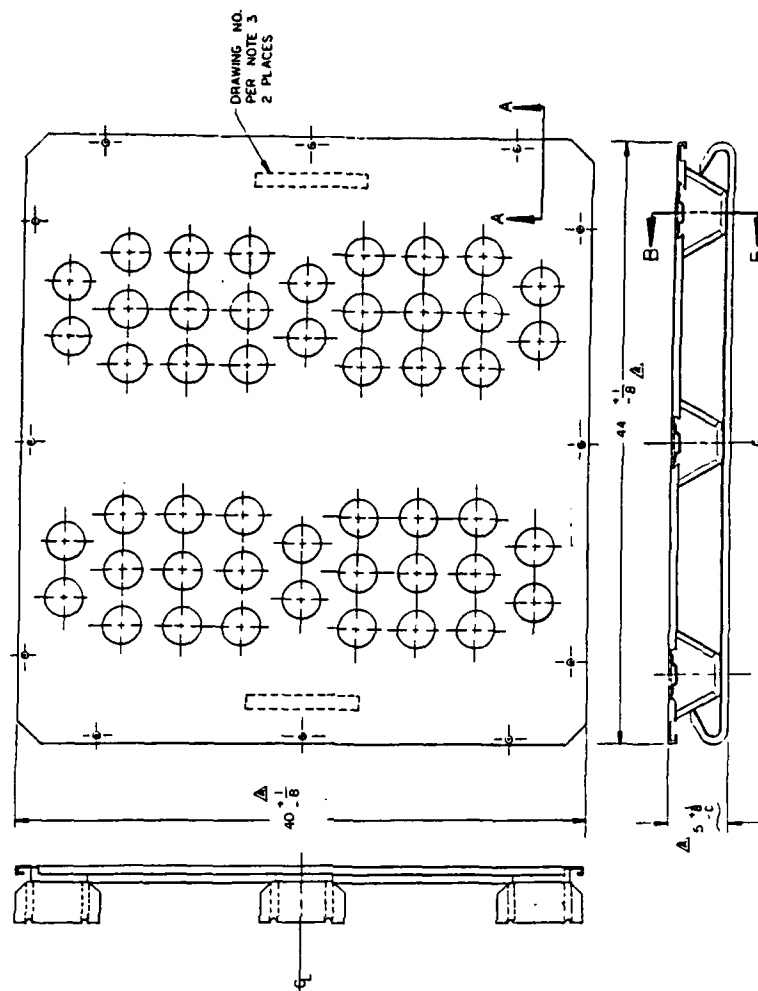


SECTION B-B
NOT TO SCALE



NOTES:

1. SPEC MIL-A-2550 AMERICAN WELDING SOCIETY STD A 2.4-49 ASTM Y14.5 B2 APPLY
2. PROTECTIVE FINISH SHALL BE IN ACCORDANCE WITH DWG AC200000423
3. COLOR SHALL BE GREEN NO. 383 PER MIL C-4616B (FED STD 595, NO. 34096)
4. MARKING SHALL BE IN ACCORDANCE WITH DWG AC200000423
5. COLOR SHALL BE WHITE NO. 37875 1/4 INCH HIGH LETTERS



DRAWING NO.
PER NOTE 3
2 PLACES

APPLICATION		DATE		BY		CHECKED		APPROVED	
ARMAMENT, MUNITIONS & CHEMICAL COMMAND		14 NOV 62		J. H. Z. Long					
PALLETT -									
STANDARD SIZE 44 X 40									
SHEET METAL									
D 28520									
AC200000431									

REVISION			
REV	DESCRIPTION	DATE	APPROVED

DASH NO.	A	B	C	D
-1	.50	.59	.50	.43
-2	.50	.59	.43	.37
-3	.50	.59	.37	.31
-4	.50	.59	.31	.25

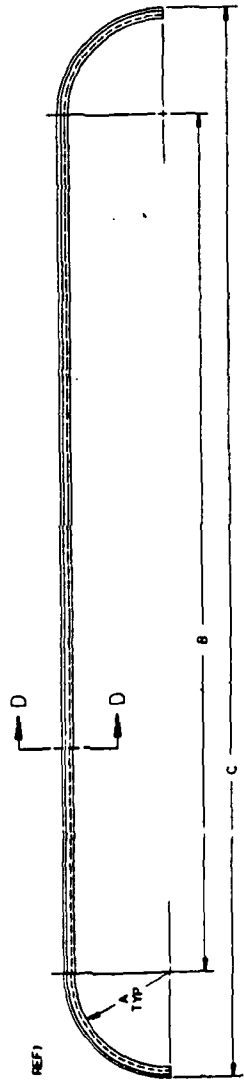
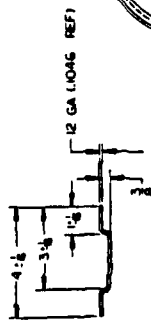
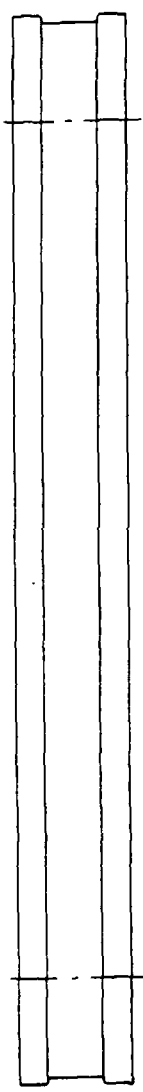
NOTES

- SPEC ANSI Y14.5M-82 APPLY.
- MATERIAL: STEEL, MEDIUM CARBON, HOT ROLL, PER ASTM A36
- ALL DIMENSIONS ARE IN INCHES.

DATE: 6-5-87		US ARMY ARMAMENT, MUNITIONS & CHEMICAL COMMAND AMMUNITION SUPPORT EQUIPMENT	
DRAWN MM	CHECKED J.S. [Signature]	LUG - ALIGNING, METAL PALLET	
<i>John L. [Signature]</i> <small>ENGINEER, U.S. ARMY AMMUNITION CENTER AND SCHOOL</small>		<small>COMP. ORG. NO.</small> C 28620	<small>AC2000000453</small>
<small>STANDARD DRAWING SYMBOLS AND DIMENSIONS</small> <small>UNLESS OTHERWISE SPECIFIED</small> <small>ALL DIMENSIONS ARE IN INCHES</small> <small>FRACTIONS ARE 1/16</small> <small>DECIMALS ARE 0.002</small> <small>ANGLES ARE 1/2°</small>		<small>SCALE</small> 2/1 <small>SHEET</small> 1 OF 1	

STANDARD DRAWING SYMBOLS AND DIMENSIONS

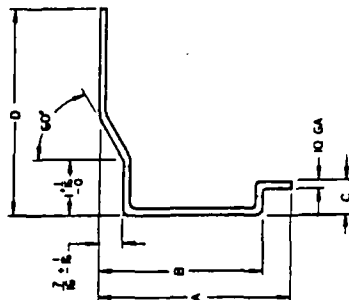
REV	DATE	BY	APP
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DIMENSIONS				NEXT ASSEMBLY
DASH NO.	A	B	C	
-1	3 1/8	31 1/8	90 1/8	AC200000469
-2	3 3/8	34 1/8	41 1/8	AC200000471

- NOTES:
1. BEND RADIUS: 1/8 INCH MAX. WHERE NOT NOTED.
 2. SEC. ANGLE: 1/4 S. BOM APPL.
 3. MATERIAL: SHEET, SAE OR ANS. 1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568.
 4. ALL DIMENSIONS ARE IN INCHES.

6-5-87 MIN. 1/2" DIA. MAX. 1/2" DIA. 1/2" DIA.		6-5-87 MIN. 1/2" DIA. MAX. 1/2" DIA. 1/2" DIA.	
ARMAMENT, MUNITIONS & CHEMICAL COMMAND SUBORDINATE SUPPORT ELEMENT		BOW - STRAPPING, METAL PALLET	
D 28820		AC200000460	
1/2" DIA. 1/2" DIA.		1/2" DIA. 1/2" DIA.	
APPLICATION		APPLICATION	



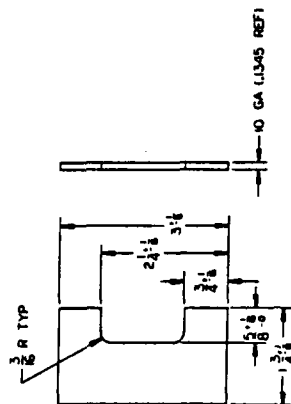
DASH NO	DIMENSIONS										NEXT ASSEMBLY
	A	B	C	D	E	F	G	H	I	J	
-1	3	3	3	3	3	0	0	0	0	0	AC200000469
-2	3	3	3	3	3	0	0	0	0	0	AC2000000411

1. BEND RADIUS: 1/8-INCH MAXIMUM (WHERE NOT NOTED).
2. SPEC ANSI Y16.0-82 APPLY.
3. MATERIAL: SUT SAE OR ANSI 1010 STL., CARBON, COLD ROLL OR HOT ROLL PER ASTM A569.
4. ALL DIMENSIONS ARE IN INCHES.

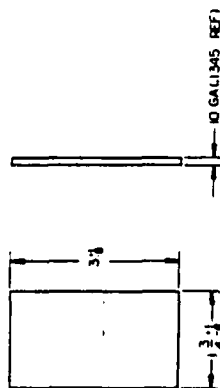
• $\frac{1}{2}$ B Type

SECTION A-A

[illegible]



2



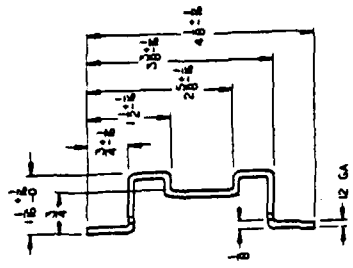
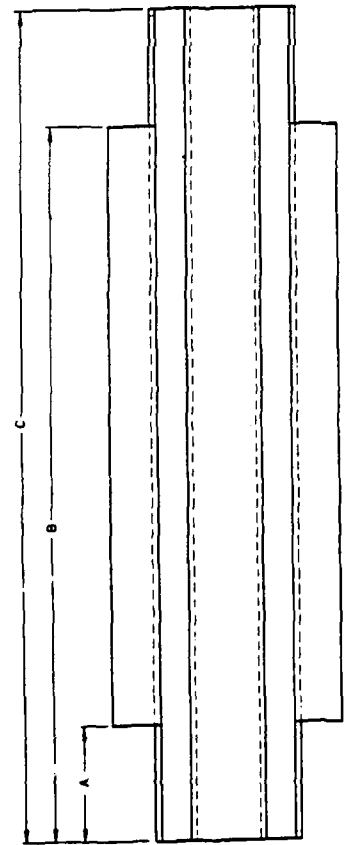
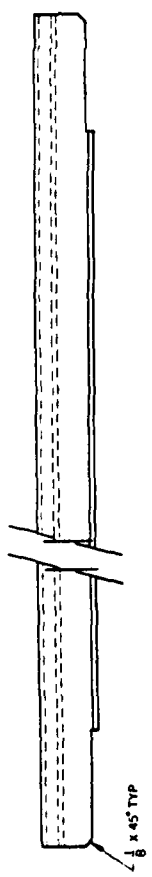
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NOTES:

1. SPEC ANSI Y14.5 B2M APPLY.
2. MATERIALS: SHEET SAE OR
ANSI 1010 STEEL CARBON,
COLD ROLL OR HOT ROLL,
PER ASTM A568.
3. ALL DIMENSIONS ARE IN INCHES.

[illegible]

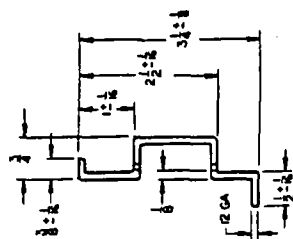
REVISION	DATE	BY
1		



DASH NO.	DIMENSIONS			NEXT ASSEMBLY
	A	B	C	
-1	2 1/8	37 1/2	39 1/8	AC2000000470
-2	2 1/8	40 1/2	42 1/8	AC2000000474

- NOTES:
1. BEND RADIUS 1/8-INCH MAXIMUM WHERE NOT NOTED.
 2. SPEC AREA TYP. 1/8" TYP. 1010 STL. CARBON.
 3. GOLD ROLL OR NOT ROLL PER ASTM ASSG.
 4. ALL DIMENSIONS ARE IN INCHES.

6-8-07 STIFFENER, SQUARE BELL METAL PALLET ADAPTER		ARMA-TEK ARMA-TEK INDUSTRIES & CHEMICAL COMPANY ARMA-TEK INDUSTRIES & CHEMICAL COMPANY ARMA-TEK INDUSTRIES & CHEMICAL COMPANY
D 28820 AC2000000464	1 1 1	1 1 1

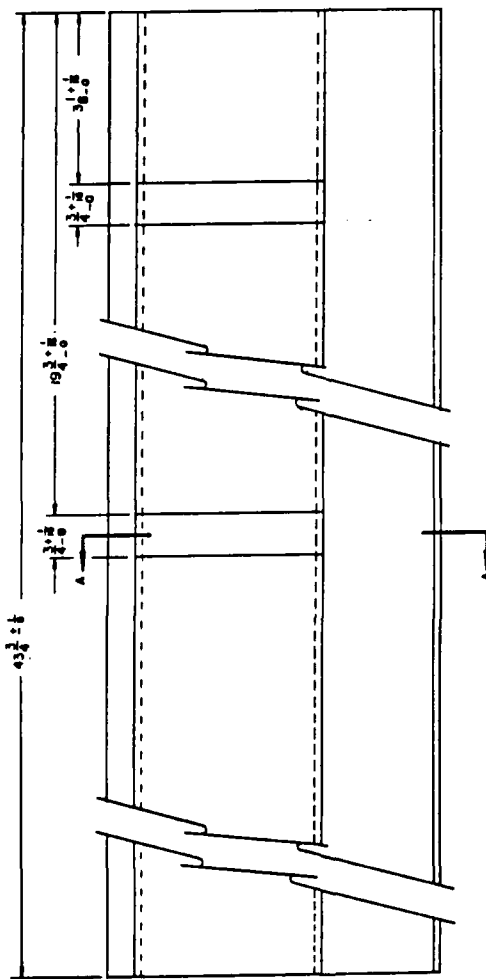
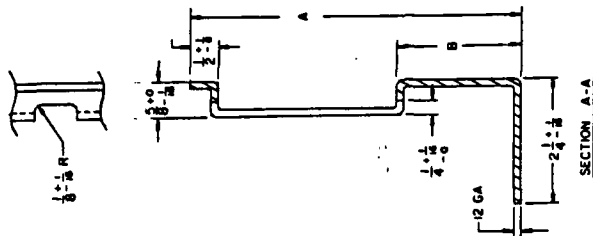


DASH NO.	DIMENSIONS					NEXT ASSEMBLY
	A	B	C	D	E	
-1	2 1/8	37 1/2	39 1/2			AC2000000470
-2	2 1/8	40 1/2	42 1/2			AC2000000472

1. BEND RADII 1/8-INCH MAXIMUM WHERE NOT NOTED.
2. SPCC ANSI Y14.5-62 APPL.
3. MATERIAL: SET SAE OR ANSI 1010 STL. CARBON. COLD ROLL OR NOT ROLL PER ASTM A588.
4. ALL DIMENSIONS ARE IN INCHES.

[illegible]

REVISION



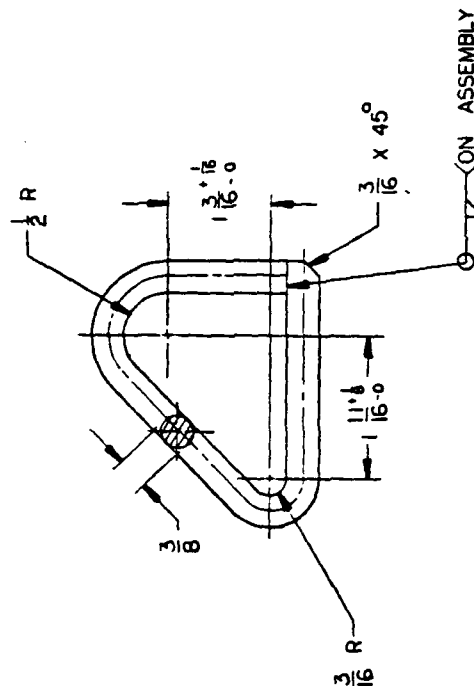
DASH NO.	DIMENSIONS		NEXT ASSEMBLY
	A	B	
-1	6	2 1/4	AC200000470
-2	5 1/2	1 1/2	ALC000000472

NOTES:

1. BEED RADII 1/8-INCH MAXIMUM WHERE NOT NOTED.
2. SPEC ASSY 116.2-02 APPLY.
3. SPEC ASSY 116.2-02 APPLY.
4. ALL DIMENSIONS ARE IN INCHES.

10 JAN 73 ARMAMENT, MUNITIONS & CHEMICAL COMMAND ASSAULTING SUPPORT ELEMENT	
RAIL BOTTOM METAL PALLET ADAPTER	
D 28820	AC200000466
APPLICATION	

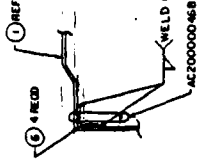
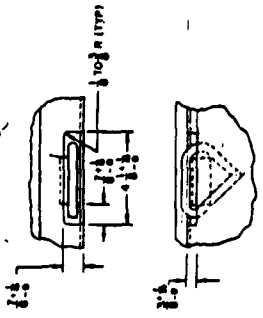
REVISION			
NO.	DESCRIPTION	DATE	BY
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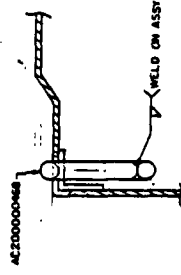
NOTES:

1. SPEC ANSI Y14.5M-82 APPLY.
2. MATERIAL: STEEL, MEDIUM CARBON, HOT ROLL, PER ASTM A36.
3. ALL DIMENSIONS ARE IN INCHES.

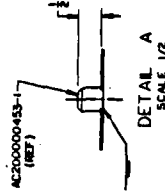
US ARMY ARMAMENT, MUNITIONS & CHEMICAL COMMAND AMMUNITION SUPPORT EQUIPMENT		RING - LIFTING, METAL PALLET	C 28620 AC200000468
DATE 6-5-87	DRAWN J. J. J.	CHECKED J. J. J.	APPROVED J. J. J.
TITLE RING - LIFTING, METAL PALLET			
SCALE 1" = 1"			
MATERIAL STEEL, MEDIUM CARBON, HOT ROLL, PER ASTM A36			
DIMENSIONS ALL DIMENSIONS ARE IN INCHES			
APPLICATION			



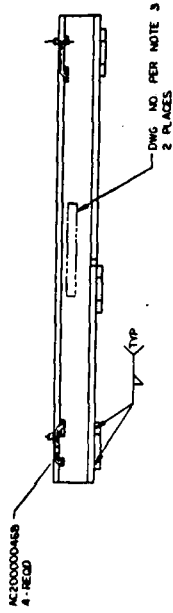
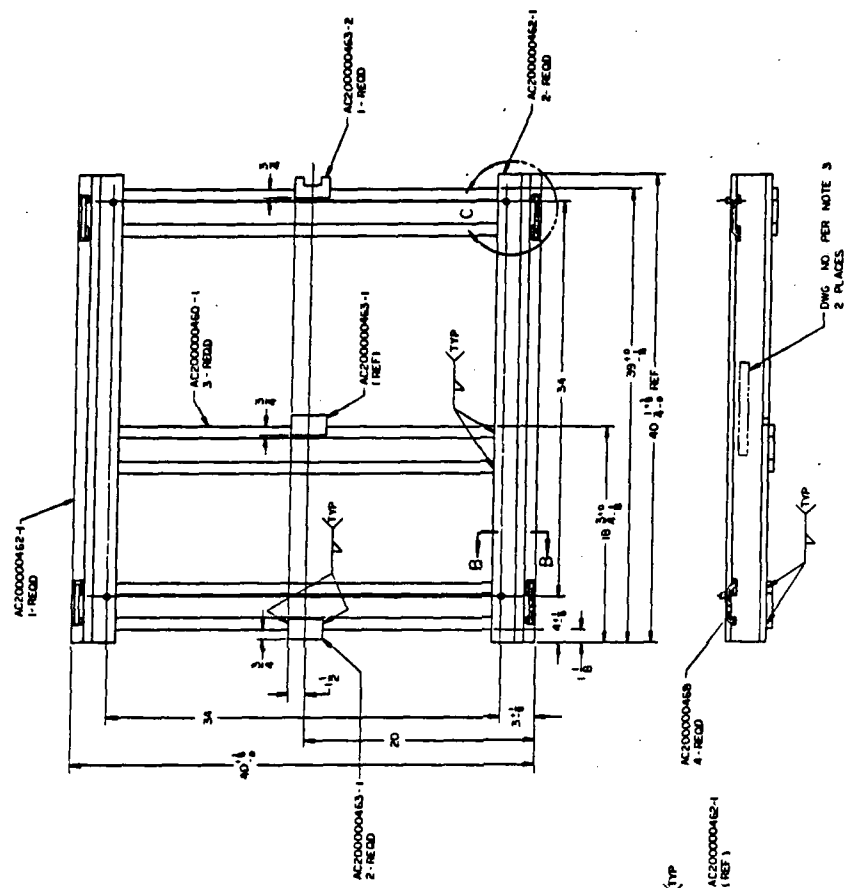
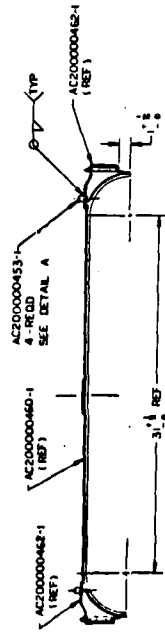
ALTERNATE DETAIL C
SCALE 1/2



SECTION B-B
SCALE 1/1

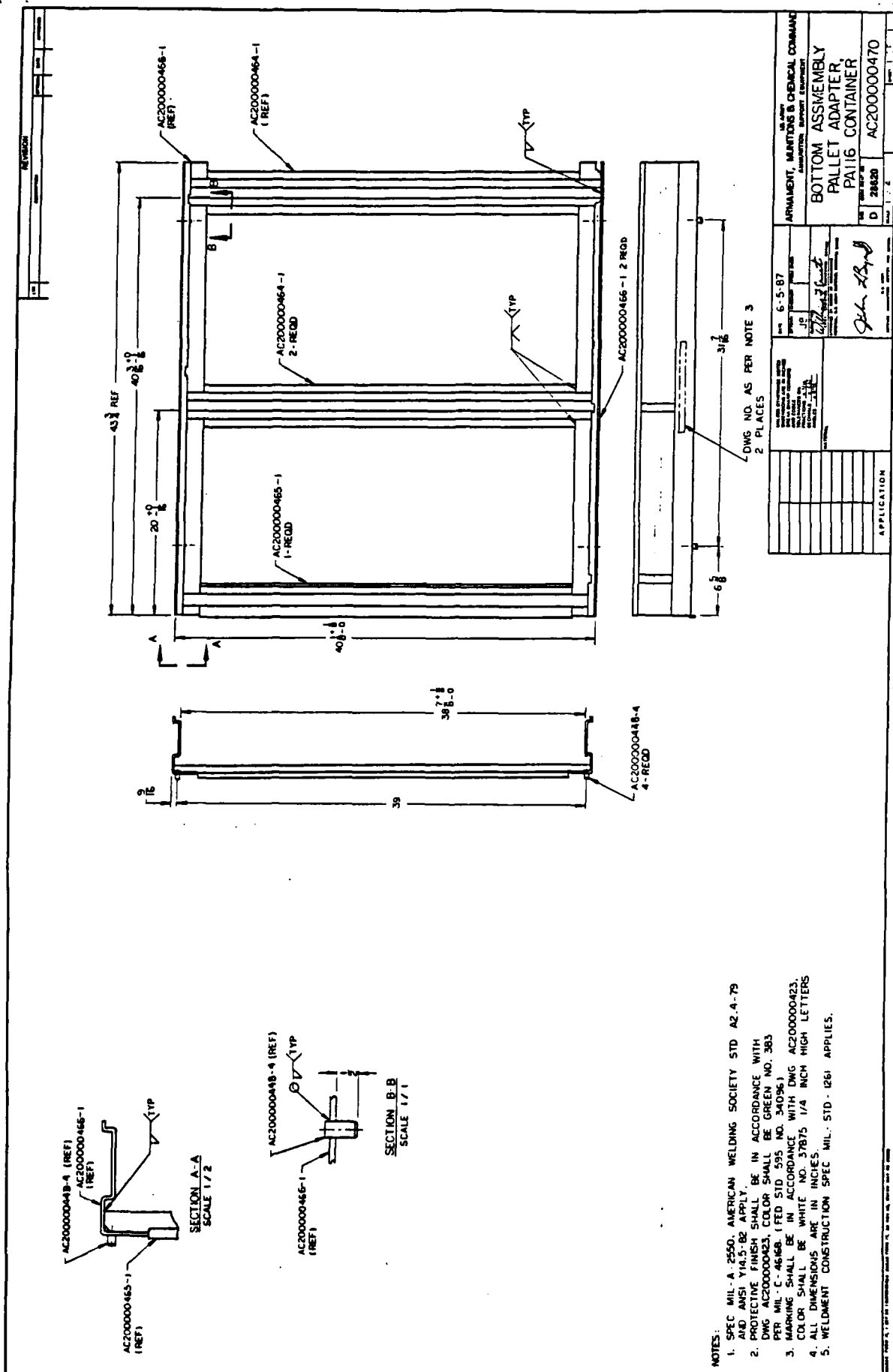


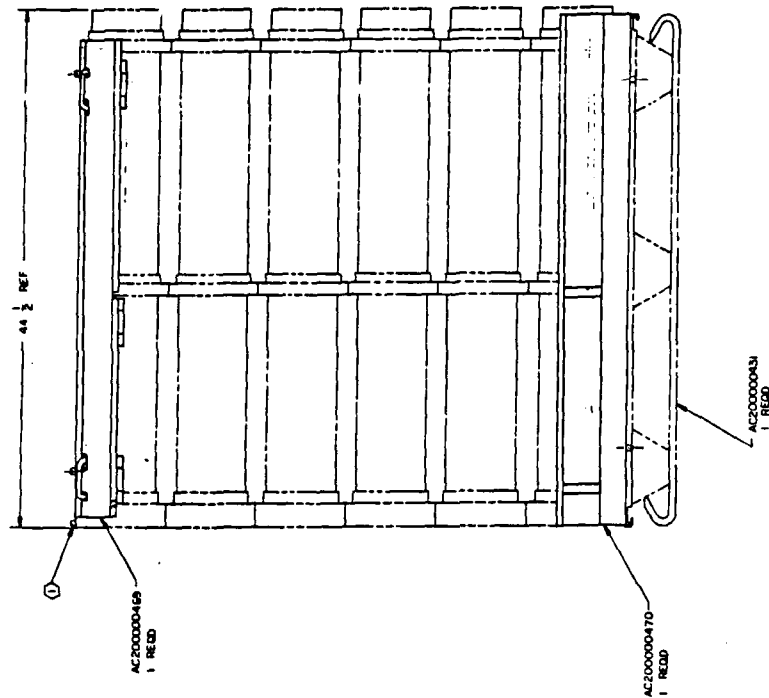
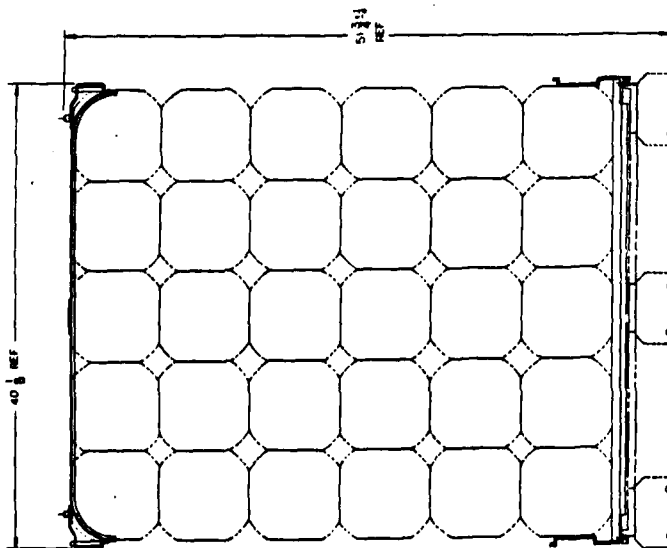
DETAIL A
SCALE 1/2



- NOTES:
1. SPEC MIL-A-2550, AMERICAN WELDING SOCIETY STD A2.4-75
 2. PROTECTIVE FINISH SHALL BE IN ACCORDANCE WITH PER MIL-C-46468 (17ED STD 595 NO. 34096)
 3. DIMENSIONS SHALL BE IN ACCORDANCE WITH DWG AC200000462, CONSTRUCTION SPEC MIL-STD-106 APPLIES.
 4. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 5. WELDMENT CONSTRUCTION SPEC MIL-STD-106 APPLIES.

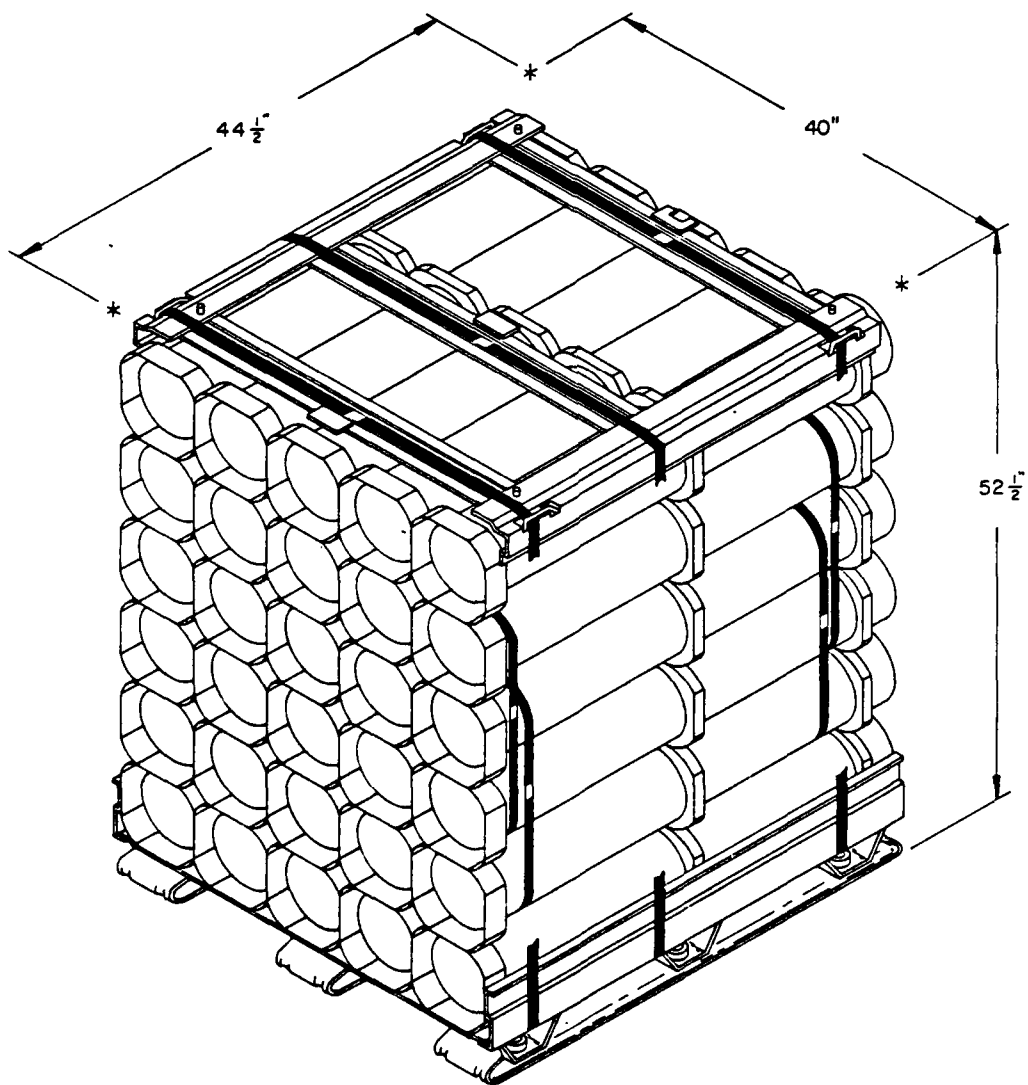
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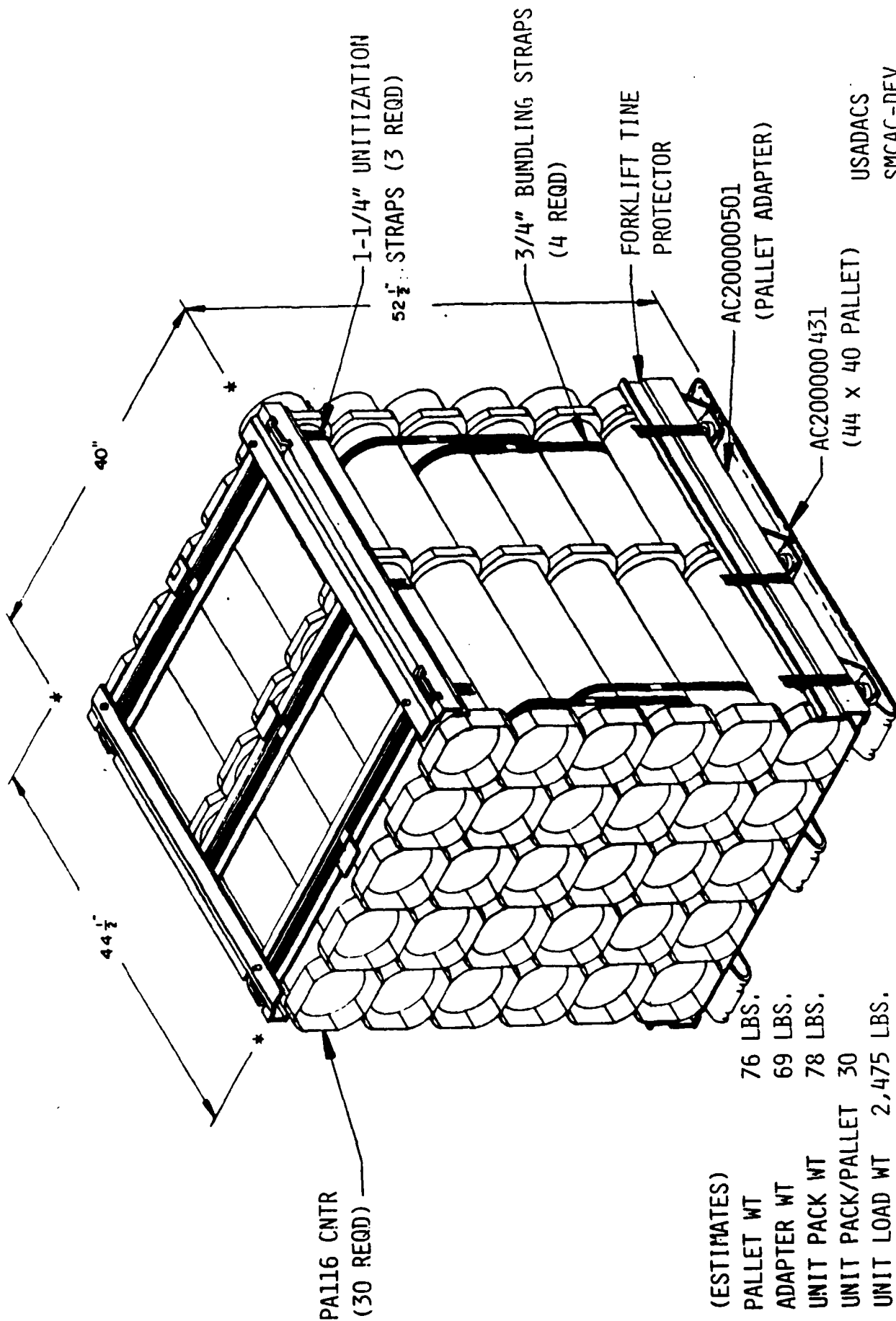


NOTES:
 ① 1 STANCHION LUGS POSITIONED ON TOP OF CONTAINERS.
 2. ALL DIMENSIONS ARE IN INCHES.

PART 6.5.87 NAME: <i>John J. Long</i> GRADE: <i>Major</i> SIGNATURE: <i>[Signature]</i> DATE: <i>11/10/87</i>		ORGANIZATION: <i>ARMED SERVICES & CHEMICAL COMMAND</i> FUNCTION: <i>ADAPTER - PALLET</i> TITLE: <i>PAIIS CONTAINER</i>	
PROJECT: <i>AC200000501</i> DRAWING: <i>21820</i> SCALE: <i>1/8"</i>		DRAWING: <i>AC200000501</i> SCALE: <i>1/8"</i>	
APPLICATION:		APPLICATION:	



PALLETIZED UNIT LOAD FOR THE PAL16 CONTAINER



USADACS
SMCAC-DEV
SAVANNA, 11

JULY 1987